



MINERVA triangle test

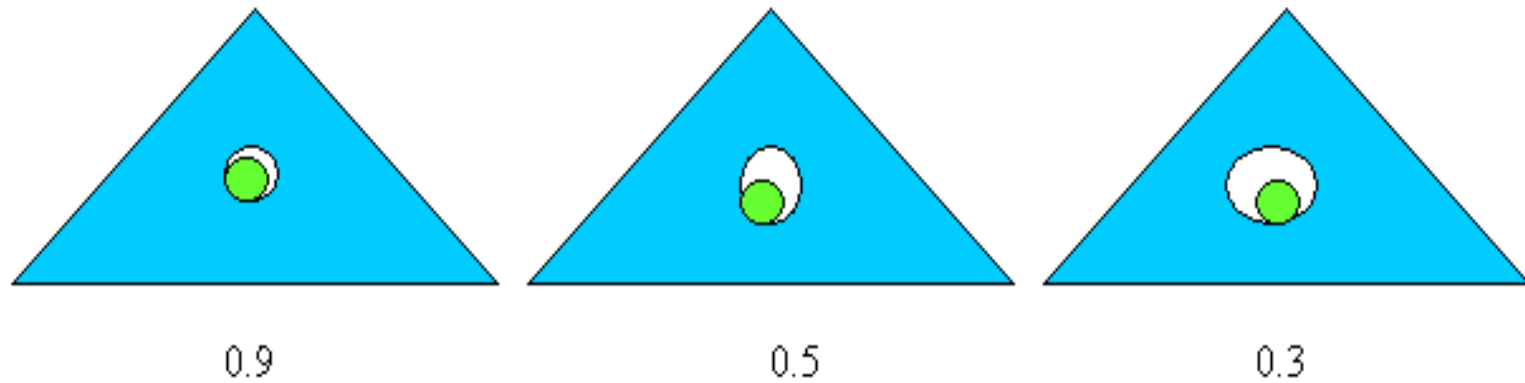
Brian Wood, Victor Rykalin
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FNAL-NICADD

Outlines

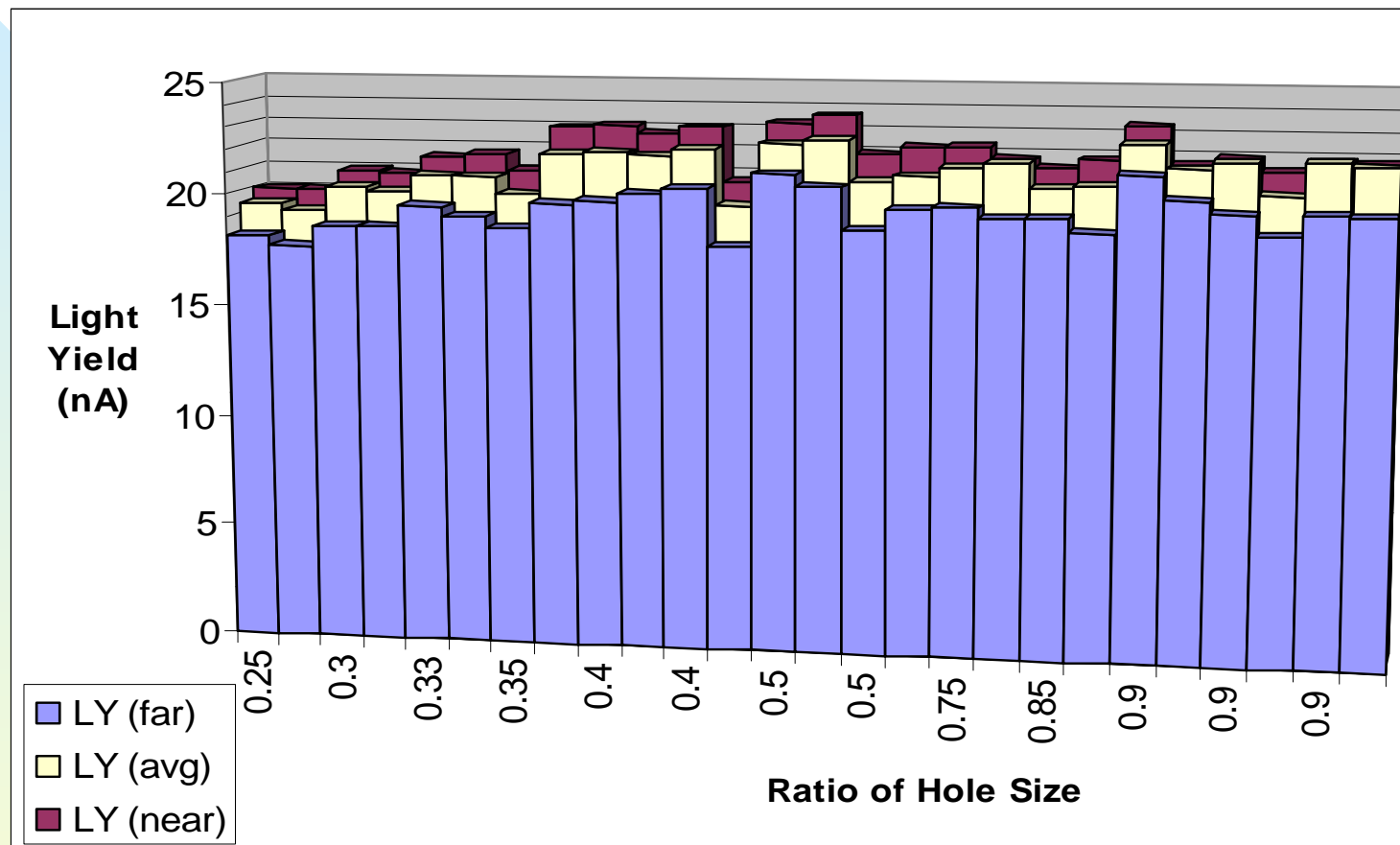
- *Relative LY vs hole size.*
- *Relative LY with glue or without glue.*
- *Absolute LY on cosmic rays.*

Test with fibers



Ratio of surfaces = $S_{\text{fiber}}/S_{\text{hole}}$

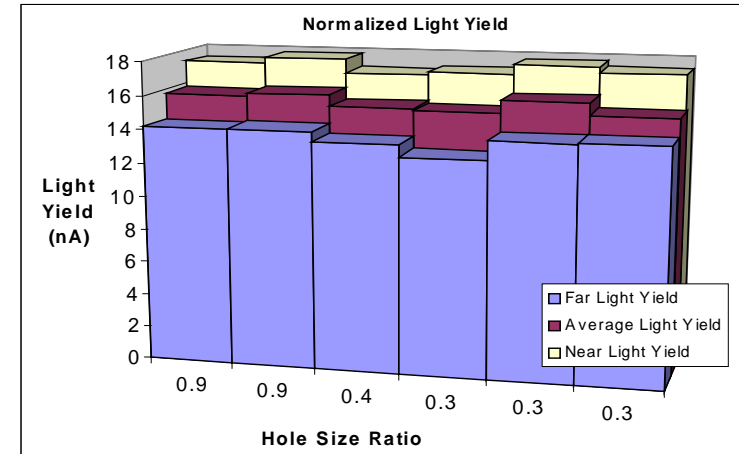
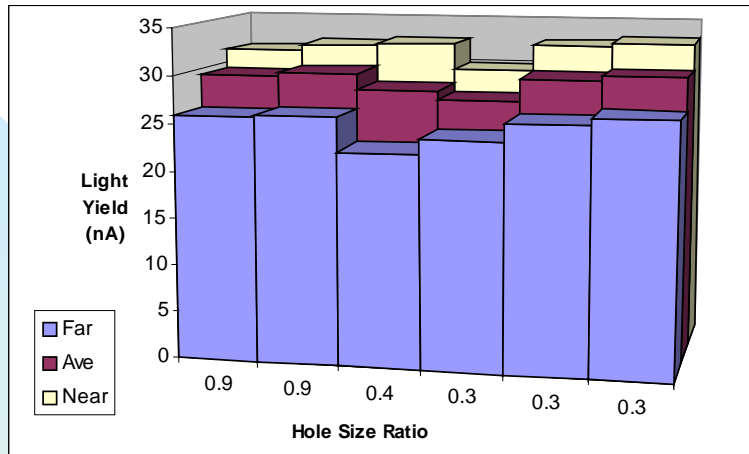
Results on the relative LY with fibers (no optical glue)



Spread:

Far: 11.92% Ave: 9.01% Near: 6.76%

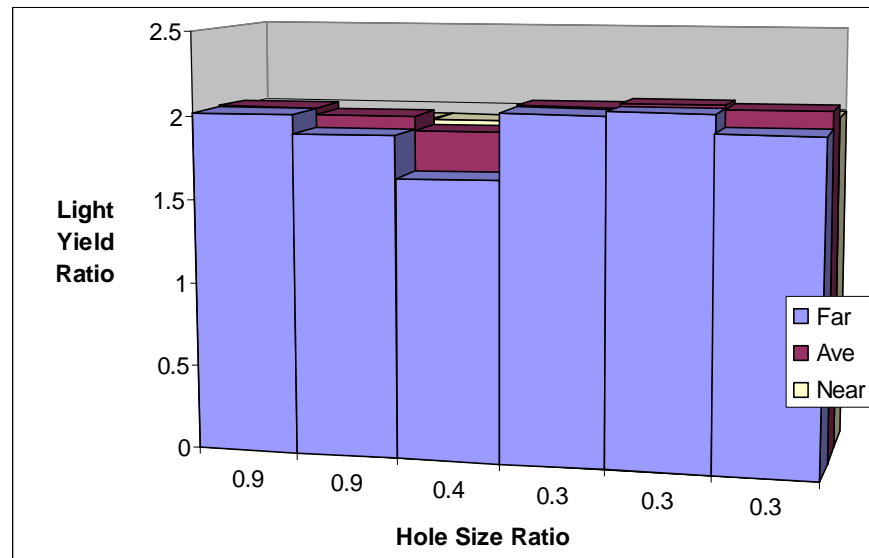
LY with/without glue(BC600)



Far: 5.90% Ave: 4.25%Near: 3.91%

Far: 3.66% Ave: 2.18% Near: 1.83%

Aver. Ratios:
Far = 1.94
Ave = 2.02
Near = 1.95



Cosmic test result, absolute LY, final.

Scaling to the first electron

N_{pe} ~ 28

Gauss fit (left edge)~24 $N = \left(\frac{A}{\sigma}\right)^2$

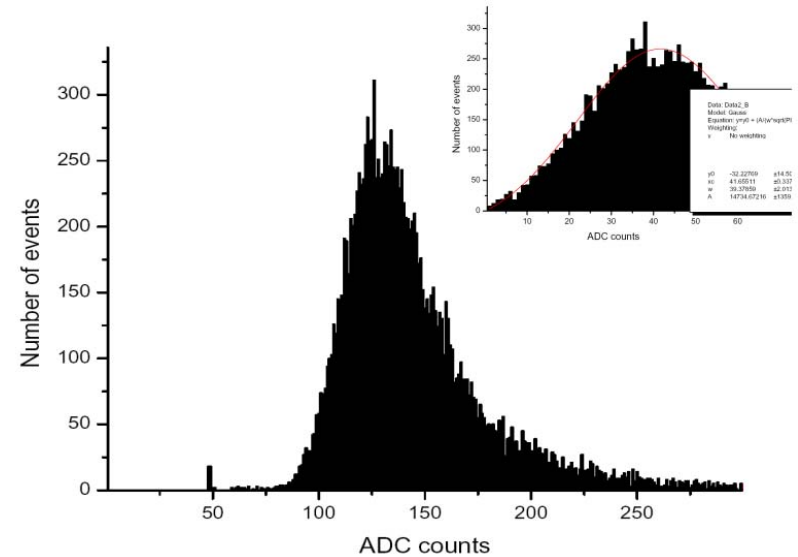
Correction to the scintillator thickness (1.7 cm)

gives ~22 PE,

~ 18 PE.

H3178-61 was used

Y11, 1.2 mm,1.5 m(1m trigger-PMT)



The fibers without reflective end where used !

<u>Measurement Synopsis</u>	<u>Number of Strips Measured</u>	<u>Results</u>	<u>Comments</u>
Measured Attenuation Lengths	40 (20 1.2mm hole) (20 1.5mm hole)	1.2mm hole: 30.52±0.74 cm 1.5mm hole: 30.33±0.77 cm	Witness to even distribution of dopants inside plastic (2-3% Spread)
Effect on Light Yield due to hole size (without reflective end)	15	Spread: Far: 11.92% Ave: 9.01% Near: 6.76%	No visible relationship between light yields and hole sizes for the ratio(0.9-0.4)
Measured Light Yields with WLS Optical Fibers	6	Far: 3.66% Ave: 2.18% Near: 1.83%	Calibrated and Normalized fibers
Measured Light Yield of strips	6	Far: 5.90% Ave: 4.25% Near: 3.91%	No visible relationship between light yields and hole sizes
Measured Light Yield of strips, each with their own fiber and glue	6	Without Glue: Ave: 14.39 nA With Glue: Ave: 29.02 nA	~190-200% increase in light yield compared to without BC600 glue
Cosmic Light Yield	2	18.4 ± 0.8	The results is consistent within 20%



STUDY OF NEW TRIANGULAR TYPE FNAL-NICADD EXTRUDED SCINTILLATOR FOR THE MINERvA DETECTOR

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Will be published shortly